

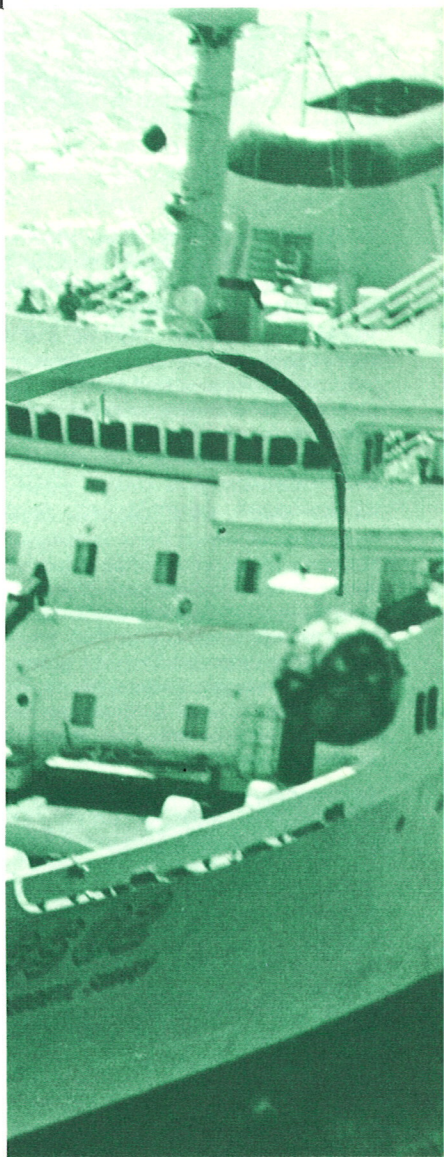
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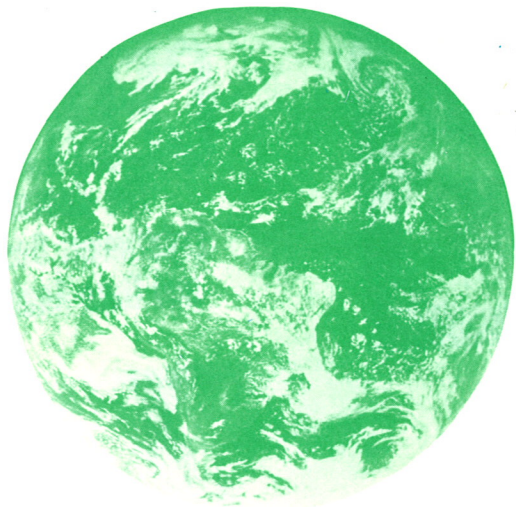


CEDDA

The Center for
Experiment Design
and Data Analysis

U.S.
DEPARTMENT
OF
COMMERCE
National
Oceanic and
Atmospheric
Administration
Environmental
Data Service





To comprehend this cloud-wreathed water planet, scientists probe, measure, simulate, describe, predict, and modify the intricately interwoven physical processes linking solid earth and ocean and atmosphere. NOAA, the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce, helps make these varied searches for new knowledge yield a coherent view, and, through its Environmental Data Service, makes the immense quantities of data these studies produce accessible in a variety of useful forms.

As the planet itself becomes more and more the laboratory in which these investigations proceed, the problem of how to gather important data, and how to analyze, archive, and disseminate it, becomes specific—ambitious experiments in the natural laboratory require ambitious data acquisition and analysis, and ambitious efforts to return the new knowledge to those who can apply it. This is the work of CEDDA, the Center for Experiment Design and Data Analysis, one of the five major facilities* of the Environmental Data Service.

At present, CEDDA is concerned with three such field projects: BOMEX, the Barbados Oceanographic and Meteorological Experiment; IFYGL, the International Field Year for the Great Lakes; and GATE, the GARP (Global Atmospheric Research Program) Atlantic Tropical Experiment.

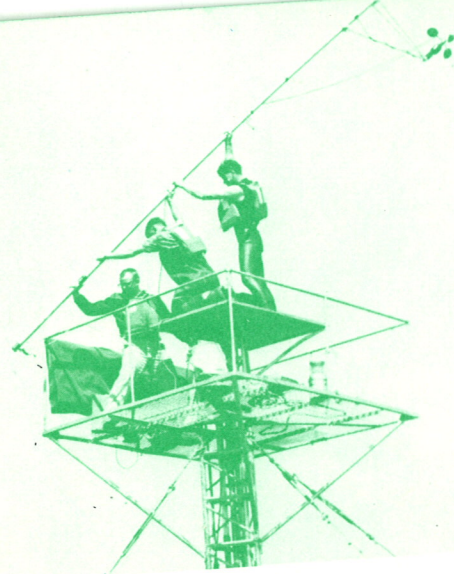
* Others are the National Climatic Center, Asheville, N.C.; the National Oceanographic Data Center, Washington, D.C.; the National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.; and the Environmental Science Information Center, Washington, D.C.



BOMEX was conducted in the tropical Atlantic east of Barbados in May, June, and July 1969 as a national, multiagency study of the behavior and interaction of the ocean-atmosphere system in subtropical and tropical waters. Ships, aircraft, buoys, satellites, and island stations were used as observation platforms within a 500-kilometer by 500-kilometer square, with data taken from the ocean floor to the stratosphere. Conducted in cooperation with the Government of Barbados, BOMEX involved the U.S. Departments of Commerce, Defense, Transportation, and the Interior, the National Aeronautics and Space Administration, the National Science Foundation, and numerous universities and other institutions.

With the end of field operations, the Barbados Oceanographic and Meteorological Analysis Project office (now CEDDA) was established to reduce, process, and validate BOMEX data. BOMEX data for which CEDDA is responsible include: salinity-temperature-depth soundings to a depth of 1,000 meters; shipboard meteorological observations and rawinsonde data; low-level atmospheric soundings made with the Boundary Layer Instrument Package (BLIP); aircraft dropsonde and other meteorological observations; shipboard and land-based radar observations; high-level (50,000 and 60,000 feet) panoramic cloud photographs; intermediate and low-level time-lapse cloud photographs; and satellite cloud imagery.

In addition to data management, CEDDA is also completing analysis of the BOMEX "core experiment"—evaluating the energy budget of the atmospheric volume overlying the BOMEX array and the upper ocean beneath the array, and computing the energy flux across the sea-air boundary.



IFYGL is a joint United States-Canada program of environmental research aimed at achieving more effective management of Great Lakes water resources and at solving the water management problems posed by a growing population in the Great Lakes basin area. Lake Ontario and the Ontario basin were the subject of the field operations (April 1972 through March 1973) which were designed to provide data for these closely coordinated international scientific programs: terrestrial water balance, atmospheric water balance, evaporation synthesis, lake heat balance, lake chemistry and biology, water movement (lake circulation), atmospheric boundary layer, and simulation. Participants included scientists from eight federal and state agencies, and representatives of a number of universities and research institutions.

CEDDA's IFYGL involvement began early, to help provide data-acquisition systems that would yield the most comprehensive and accurate physical, chemical, and biological information possible. From IFYGL's Rochester, N.Y., headquarters, CEDDA has monitored the continuous data flow from ships, aircraft, buoys, towers, and land stations, and has helped to maintain control over the quality of the data collected.

CEDDA will also be responsible for processing, editing, and reducing the bulk of the data collected by United States IFYGL systems, and for placing them, with other IFYGL data, in a permanent archive. CEDDA is also undertaking three major research tasks—boundary layer flux synthesis, atmospheric water balance, and evaporation synthesis.

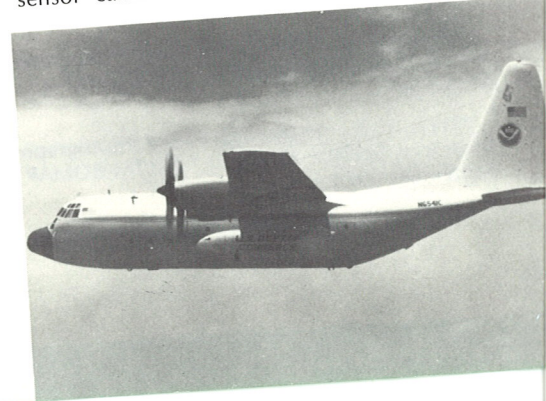
GATE, scheduled for the summer of 1974, is the first major observational experiment of the Global Atmospheric Research Program, sponsored jointly by the World Meteorological Organization and the International Council of Scientific Unions. This multinational research project will span the Atlantic Ocean and will be the most ambitious project yet undertaken to study the equatorial atmosphere and ocean—the main heat sources driving the atmosphere's general circulation.

CEDDA's main responsibility here, as in IFYGL, is to establish data management procedures before field operations begin, ensure that these procedures are followed during the field program, and later reduce part of the data collected by United States acquisition systems into final archive form. CEDDA may also merge sets of data obtained by the many participating nations into international data sets designed for specialized scientific analyses.

Also as in IFYGL, CEDDA is participating in the development and testing of special acquisition systems, specifically the automatic data-acquisition system to be used aboard United States ships during GATE, the Omega rawinsonde tracking system, and the GATE version of the BLIP.

As part of the overall environmental budget studies program of GATE, CEDDA will undertake the analysis of the bulk atmospheric budgets of the "B-scale" area, a portion of the Atlantic Ocean off the North African coast chosen for intensive, concentrated observations. CEDDA is also assigned responsibility for radar analyses, and planetary boundary layer studies.

The CEDDA scientists and systems analysts who will be responsible for deriving specific data and scientific products from the GATE field program are playing a key part in the planning of the experiment. By formulating specific data requirements and analyzing the effects of various alternative designs, they are able to recommend many details of platform array configuration, observation scheduling, sensor calibrations, and intercomparison activities.



Publications from CEDDA

BOMEX Bulletins

A series of occasional reports on the progress of the 100 individual BOMEX experiments, discussions and examples of processed data, descriptions of analyses performed by scientists within and outside CEDDA, and bibliographies of BOMEX-related papers.

Technical Memoranda

A series of preliminary reports on experiments for which CEDDA is handling data analysis and processing. At present, these BOMEX titles are available:

Holland, J. Z., "The BOMEX Sea-Air Interaction Program: Background and Results to Date," ERL BOMAP-9, April 1972.

Horner, T. W., "A Statistical Data Plan for BOMEX," ERL BOMAP-2, December 1970.

Myers, V. A., "High-Level Cloud Photography Inventory, BOMEX Period I," ERL BOMAP-7, December 1971.

Myers, V. A., "High-Level Cloud Photography Inventory, BOMEX Period II," ERL BOMAP-4, March 1971.

Myers, V. A., "High-Level Cloud Photography Inventory, BOMEX Period IV," ERLTM-BOMAP 1, September 1970.

Myers, V. A., and Martin Predoehl, "BOMEX

Flight Tracks Reconstructed From Near-Simultaneous High-Level Cloud Photography by Two Aircraft," ERL BOMAP-8, December 1971.

Rasmusson, E. M., "Mass, Momentum, and Energy Budget Equations for BOMAP Computations," ERL BOMAP-3, January 1971.

Reeves, R. W., "Preliminary Velocity Divergence Computations for BOMEX Volume Based on Aircraft Winds," ERL BOMAP-5, April 1971.

Wisner, W. M., "Ship's Influence on Surface and Rawinsonde Temperatures During BOMEX," ERL BOMAP-6, June 1971.

Atlases

A series of collected and specially processed data obtained during a major field operation. These BOMEX Atlases are now available:

BOMAP Office, *BOMEX Period III High-Level Cloud Photography Atlas*, May 1971.

BOMAP Office, *BOMEX Field Observations and Basic Data Inventory*, March 1971.

Delnore, V. E., *BOMEX Period III Upper Ocean Soundings*, in press.

Myers, V. A., *BOMEX Atlas of Satellite Cloud Photographs*, July 1971.

CEDDA is organized around its two major program areas—data management and scientific research. Its data management services division has technical responsibility for data management from delivery of original records by acquisition personnel in the field to the archiving of final data and data products. The research division assists in recommending, monitoring, reviewing, and testing data acquisition systems and procedures to ensure that these data will be of optimum quality not only for the scientific analyses carried out within the division, but for data users within the international scientific community. Computer and graphics support are provided by two other groups in CEDDA.

For more information, write:

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